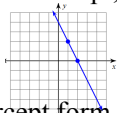Problem of the Day: Find the slope, x-intercept, and y-intercept from the graph.

Plan for the Day: Notes on slope-intercept form
Finish test from yesterday
Logic puzzle for extra credit after test due Friday
Homework Week 10 is due tomorrow
Objective: We will be able to identify parts of slope-intercept form.
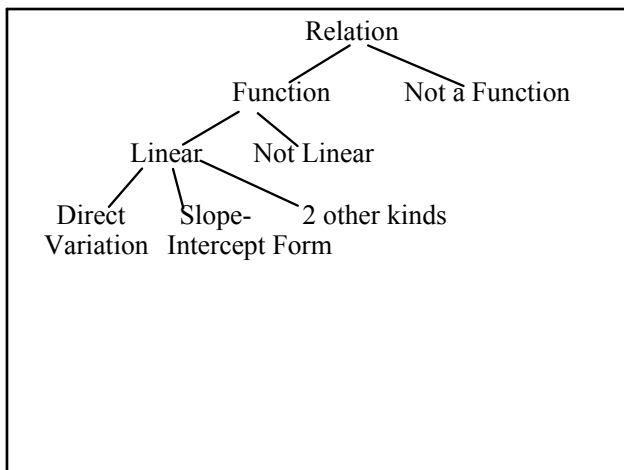Today is National Candy Corn Day!!

Example: For the given equation, find the slope, x-intercept, and y-intercept.

y = -2x + 4

X-int.
$0 = -2x + 4$
$-4 = -2x$
$\frac{-4}{-2} = \frac{-2x}{-2}$
$2 = x$
$(2, 0)$

$m = \frac{y_2 - y_1}{x_2 - x_1}$
$m = \frac{4 - 0}{0 - 2} = \frac{4}{-2} =$
$m = -2$

y-int.
$y = -2(0) + 4$
$y = 0 + 4$
$y = 4$
$(0, 4)$

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                    Relation
                  /          \
            Function        Not a Function
           /        \
      Linear       Not Linear
     /    |    \
Direct  Slope-   2 other kinds
Variation Intercept Form
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One form of linear equations is called the slope-intercept form.

Any linear function can be written in this form in order to determine the slope and y-intercept.

$$y = mx + b \qquad \text{or} \qquad f(x) = mx + b$$

m = slope
b = y-intercept

Example: Identify the slope and y-intercept for the given equations.

a. y = 4x - 8
    $m = 4$ or $\frac{4}{1}$ b = -8   (0, -8)
b. y = -3/5x + 7
    $m = \frac{-3}{5}$ b = 7
c. y = -x + 6
    $m = -1$ b = 6
d. y = x + 2/3
    $m = 1$ b = ⅔

But what happens if an equation is not in slope-intercept form?

You can change an equation into slope-intercept form by solving for y (get the y by itself). $y = mx + b$

Example: 6x - 3y = 9
$-6x \qquad -6x$
$\frac{-3y}{-3} = \frac{-6x + 9}{-3}$
$y = 2x - 3$
$m = 2 \quad b = -3$

Example: Find the slope and y-intercept for each function.

a. $6x + y = 10$

b. $f(x) = 12x - 35$

c. $5x + 4y = 28$

d. $3x + 2y = 5$

e. $4x - y = 16$

Special Cases:

For a horizontal line in the form $y = \#$, the slope is 0 and the y-intercept is whatever number $y =$.

For a vertical line in the form $x = \#$, the slope is undefined and the y-intercept does not exist.

Example: Find the slope and y-intercept.

a. $x = -4$

b. $y = 6$